Commodore 64 Home Computer

THE Commodore 64, how good is it? Does it live up to expectations? I have had one since Christmas and have now spent several hundred hours on it.

When it arrived it was wrapped in a cardboard sheet, similar to that of the VIC, and when I opened it, it looked exactly the same as the VIC, only a different color.

"How could the 64 be the same size as the VIC but be so much more powerful?" was the question that flipped through my mind.

So with screwdriver in hand we decided to see what makes this machine tick. When we opened it, to our astonishment, what stared back at us was not millions of transistors nor a hundred chips, but about 20 chips. This was unbelievable.

Maybe they accidentally left some out? But they were all there. So we decided to see what vividly imaginative title would appear on the TV screen after we turned it on.

The manual quite explicity said "plugs into any television" so we connected it to the TV, turned it on, and after a short delay the message flicked to the screen.

Yuck! It wasn't the message that was bad, it was the screen. The RF modulator was not good as the blurred picture indicated. Why couldn't it be like the Atari screen, crystal clear?

So we switched the 64 to our Profeel monitor. Ah! That's better. The message ran "COMMODORE 64, 64k ram system . . . 39811 bytes free for BASIC".

But what is this 39811 bytes free for BASIC? Where is all this 64k that everyone is raving about? Where is the extra 24k?

The manual solved the mystery. The operating system and the on-screen editor, the most advanced created to date, and other such devices occupy the missing 24k.

Mozart of the Micros

Possibly the best feature of the 64 is the sound capabilities. The Sound Interface Device (SID) chip is at the heart of this "Mozart of the micros".

For those who just want to play notes the SID has nine octaves. In comparison a piano has eight. And for those who wish to manipulate the sounds the SID has three voices.

Each voice has ADSR. For those of us without portable organs that means Attack, Decay, Sustain and Release.

Attack is the time taken when going from zero amplitude to peak amplitude.

Decay is the time taken when falling from the peak to the intermediate level.

Sustain is the length of time the intermediate level is held for. And release is the time it takes to fall to zero amplitude.

By manipulating these registers one can change the sound of the note. Make the note hollow or echo. Changing the note can make it sound like it is a trumpet or a piano.

The Commodore 64 manual tells you how to create 10 such instruments ranging from oboe to harpsichord. Personally I have also created a harmonica and a harp. Another brilliant feature is that the SID has three voices.

Each voice can be individually programmed. They can be programmed either as three individual instruments, thereby creating an orchestral effect when played in unison, or if all voices are programmed as the same instrument but playing different notes, a chord effect is produced.

Each voice also has a filter for cut-off points of high and low frequencies. These filters can be used to manipulate top end, bass, mid range and for a number of special applications.

Yet another brilliant feature unique to the 64 is its ability to process sound through an Audio In channel.

With this you can channel sound from a hi-fi system through the 64 and out again. While it is in the computer you can change the frequency, volume and wave length.

So you can take a singer or a sound effect and drop it an octave or give it a square wave form thereby giving the tone a computerised sound. Great for special effects for film making.

You can make anyone sound like a robot or an alien from outer space. This can then be recorded on the sound track of video home movie.

Advanced Graphics

The other main feature of the 64 is its advanced graphics capabilities. Like other Commodores, graphic characters are available from the keyboard. They include the usual sticks and circles and like the VIC you can program your own set.

This graphics from the keyboard is one of the main features that has made Commodore so popular. Apple doesn't have

graphics on the keyboard and Atari only a limited number.

The Commodore 64 programmable character set is useful when creating games, such as designing spaceships and other oddities which you can then save to use later.

You can also use this programmable character set for writing and learning foreign languages. For example you can put accents over French and German words, something you can't do with most word processing programs.

The 64 has a larger number of colors than its baby brother, the VIC (Commodore expects 20 per cent of 64 buyers to be VIC owners trading up).

On the VIC a character can be any of eight colors, while on the 64, 16 colors are accessible from the keyboard. The new inclusions are orange, three shades of grey, a much wanted skin tone (light red) for human characteristics, a much needed brown, light blue and light green.

The most powerful facility on the 64 is the sprite.

Moveable Object Blocks (MOBs or SPRITES to us) are the most powerful graphics tools created by computer.

Called shape tables on the Apple and player missiles on Atari, sprites are sections of the computer's memory in any graphic design wanted by the programmer.

The sprite originated from the arcade games. The laser cannon you fire or the asteroid that just pulverised you in your favorite coin-op is a sprite. But on the 64 the power of the sprite has been increased.

In the 64 the sprites can pass over each other, behind scenery, detect whether they are on top of another sprite or behind one. The sprite can be expanded on its X and Y axis to become taller or fatter, and can also be any of 16 colors.

The sprites have their own chip in memory which controls all of them. This technique is used so that the CUP is free to get on with the other tasks.

Last of the 64 graphics features is its high resolution display. The high resolution screen is 320 pixels by 200. This gives a total of 64,000 individually accessible dots which give very detailed pictures.

The 64,000 pixels on the 64 are the best of the high resolution screens of its type available to date.

While the Commodore 64 sets new levels of sophistication in personal computing there are a few minuses that should be pointed out.

A Basic Problem

When the PET first came on to the computer scene its BASIC language was considered quite "user friendly". But as more and more machines came on to the market with more and more special commands, the title "user friendly" no longer described the PET's basic. Old-fashioned and crude became more accurate.

The 64 still has the old archaic unexpanded BASIC.

There are no special graphic or sound commands. The clever tricks the Commodore is capable of have to be done the hard way with a lot of peeking and poking or by buying special cartridges.

It is a pity because this is where I believe the Apples and Ataris gain some considerable points.

The Apple has several graphics commands such as HPLOT, DRAW, COLOR, but no sound commands. The Atari on the other hand has both sound and graphics commands such as DRAWTO, SOUND, and SETCOLOR, just a few little niceties, which make programming for the beginner so much easier.

In its favour the 64 has transparent ROMS.

The ROM is where the operating system resides, ROM, meaning Read Only Memory, is supposed to be unchangeable, but on the 64 it is possible to change it.

The advantage is that you can manipulate the 64 BASIC or add to it so you can have your special graphics or sound commands so making it as good as the Apple and Atari.

But reprogramming these ROMS is fairly advanced and something that only experienced owners would understand because the language in which the program is written is very advanced and not user friendly. So it is easy to make a mistake.

I managed to do this to expand and create new commands to give 64 the user friendly graphics and sound facility Commodore left out.

In the US, owners have replaced the BASIC altogether with another language such as PASCAL, FORTRAN, or COBOL. This is the beauty of the Commodore 64.

While it comes with its own ROM you can change it to whatever you want simply because it is transparent. This can be done simply by plugging in a cartridge with the desired language and it loads over the BASIC.

And for other programmers the ultimate question has been asked: "If the 64 is not fussy about which computer language it is using, why not take the 64's operating system and replace it with the Apple or Atari operating systems?" In doing this the 64 thinks it is an Apple or Atari and is able to run all Apple or Atari software.

The thought of this is quite terrifying. If one machine can imitate or emulate all the other computers, what is the use of having them?

Quite simply it is the price. Even though the 64 is only $699 the emulators may cost up to $1000. So it would be cheaper to buy an Atari or Apple instead of a Commodore emulator for the 64.

The 64 owner buying an Apple or Atari emulator is at a disadvantage here. But if one bought a 64 and an IBM PC emulator the purchaser would easily be at an advantage since the cost of the 64 and IMB emulator is half the price of the complete IBM computer.

And the theory of emulating a machine and instantly running the software is all very well as long as the software has been adapted to the 64 conditions. By this I mean screen size.

The 64 has a screen of 40 characters by 25 lines while the TRS-80 has 64 characters by 20 lines. So any TRS-80 software would need to be changed to fit on the 64's screen. For true emulation a special video chip could be created to switch between the most popular screen sizes.

I would recommend that anyone buying a 64 get a monitor or convert their TV for direct video in.

The RF modulator is not very good and the screen is hard to look at. The Atari in comparison is crystal clear. Why, one wonders, can Atari have such good RF modulators and the Commodores such bad ones?

Though using a television screen saves one the price of a monitor, looking at a harsh outline of a character easily tires the eyes.

Using an ordinary television screen it would be hard to distinguish between the n and m for example unless you were close. And that error could make a mess of an otherwise good program. For serious programmers a monitor television set is essential.

If Commodore had spent just a few more dollars on a high quality modulator and a few more hours on an extended BASIC the 64 would be unbeatable in the beginner's market for a long long time.

But it is too late to change. It is a machine for experienced programmers, not for beginners. For the game player the 64 will be one of the best game centres available when enough games are written for it.

Conclusion

My conclusion about the 64 is that it is an excellent computer; a computer that will last a long time on the market – something of a rarity these days when a new, bigger and better one comes out nearly every week.

The 64 may not cause the downfall of many established names in the micro-computer market as predicted, but it will certainly create a new standard in the market – especially in price. And the question is how many manufacturers can meet the challenge?